APPENDIX C

Proposed Evaluation of Patients With Normal Spirometry

EVALUATION FOLLOWS ON PAGE 356

Proposed Evaluation of Patients With Normal Spirometry

Normal Spirometry	Considerations
Spirometry Post-BD	Review spirometry for reduction in FEV_1; 12% increase post-BD diagnostic of AHR
Spirometry w/ Symptoms	Intermittent nature of asthma may require repeat spirometry when patients are symptomatic
Chest Radiograph	Will be normal in most patients; helpful to eliminate pulmonary infiltrates, effusions, or mediastinal disease
Complete Blood Count	Rule out anemia, especially in females
Inspiratory FVL	Review the inspiratory FVL on all spirometry examinations for truncation or flattening
Exercise Laryngoscopy	Presence of abnormal FVL or history of inspiratory wheezing or noisy breathing; diagnostic for vocal cord dysfunction
Bronchoprovocation Testing	With normal spirometry, important to rule out underlying airway reactivity, such as EIB
Methacholine	Most common test used for AHR, with good negative predictive value; diagnostic for EIB with associated exercise symptoms
Mannitol	Newest modality with equivalence to methacholine; requires 15% decrease in FEV_1
Eucapnic Hyperventilation	Equivalent to methacholine for diagnosing AHR, but requires a 15% decrease in FEV_1
Exercise Spirometry	Poor predictability compared with other methods and may not reproduce symptoms in laboratory setting
Impulse Oscillometry	Newer modality that measures airway resistance and may identify AHR based on reduction in post-BD values
High-Resolution CT	May identify subclinical lung disease, airway trapping, or bronchiectasis; low diagnostic yield in this population
Cardiopulmonary Exercise Testing	Primarily used to assess patient's ability to exercise and measure VO_{2max}; given limited reference values and low suspicion for cardiac disease, it may not identify specific cause
Allergy Evaluation	Consideration for allergy testing in patient with other atopic symptoms, such as atopic dermatitis and allergic rhinitis
Cardiology Evaluation	Very low likelihood of cardiac disease in a younger population; referral should be based on physical examination findings
Electrocardiogram	Numerous nonspecific changes found in younger population and are rarely diagnostic
Echocardiogram	In the absence of physical findings, it is not routinely warranted unless there are concerns for valvular disease or PH

Proposed evaluation of patients with normal spirometry. There is no single approach to evaluating the young patient with dyspnea and normal spirometry. Most consideration should be given to establishing the presence or absence of airway hyperactivity and upper airways disorders (eg, vocal cord dysfunction), and ruling out parenchymal lung disease.
AHR: airway hyperresponsiveness; BD: bronchodilation; CT: computed tomography; EIB: exercise-induced bronchospasm; FEV_1: forced expiratory volume in 1 second; FVL: flow volume loop; PH: pulmonary hypertension; VO_{2max}: maximal oxygen consumption; w/: without
Illustration: Reproduced with permission and minor changes from Zanders TB, Lucero PF, Bell DG, et al. San Antonio Military Medical Center (SAMMC): standardized evaluation of post-deployment dyspnea. Presented at: CHEST 2012 Centers of Excellence, Atlanta, GA, October 22–25, 2012.